

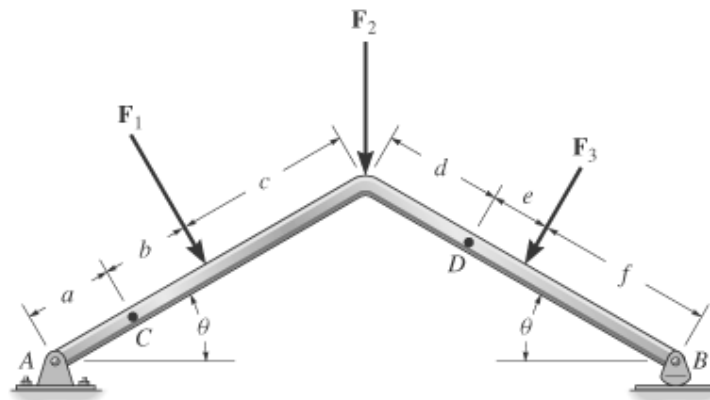
**CE 203 STRUCTURAL MECHANICS I**

Second Semester 1433 / 2012 (112)

**HOMEWORK NO. 1**

- **Textbook Sections Covered:** 1.1 - 1.4
- **Subject Material Covered:** Statics Review + Normal Stress
- **DUE DATE: Monday 14-3-1433 (6-2-2012)**

- 1) Solve problem 1-5 (p. 17) in the textbook, but let the 25-kN/m force be 60, the 15-kN force be 20, and the length of  $AD$  be 4 m (instead of 2). [Secs. 1.1 & 1.2] (20 pts.)
- 2) In the structure shown in Fig. P2, determine the normal force, shear force, and bending moment acting at sections passing through points  $C$  and  $D$ . [Secs. 1.1 & 1.2] (20 pts.)
- 3) Determine the values and locations of the maximum tensile and compressive normal stresses in Fig. P3. [Secs. 1.3 & 1.4] (20 pts.)
- 4) Each bar of the truss shown in Fig. P4 has a cross-sectional area of  $500 \text{ mm}^2$ . Determine the maximum magnitude of the load  $F$  that can be applied if the maximum average normal stress in any member is not to exceed 150 MPa in tension and 180 MPa in compression. [Secs. 1.3 & 1.4] (20 pts.)
- 5) In figure P5 shown, determine the normal stresses in the five cables shown. The area of each cable is  $100 \text{ mm}^2$ . [Secs. 1.3 & 1.4] (20 pts.)



$$a=1.5, b=1.5, c=3, d=2, e=1, f=3 \text{ (m)}$$

$$F_1 = 800, F_2 = 700, F_3 = 600 \text{ (kN)}$$

$$\theta = 30^\circ$$

**Fig. P2**

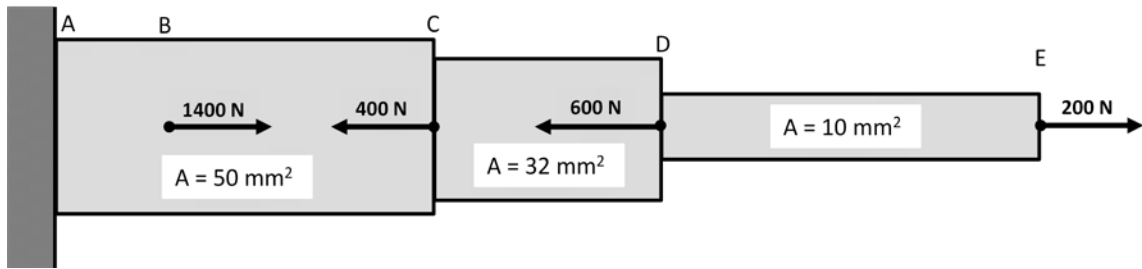


Fig. P3

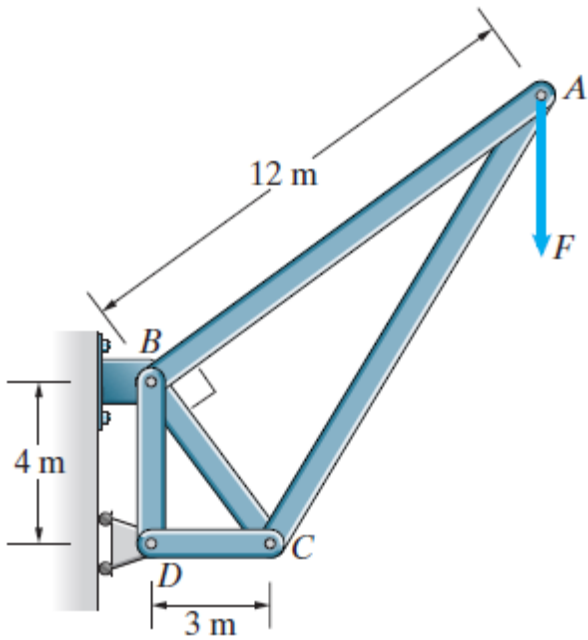
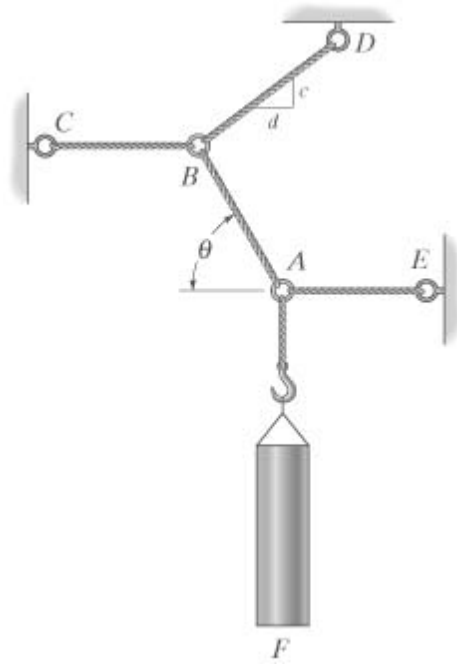


Fig. P4



$$c = 3$$

$$d = 4$$

$$M_F = 30 \text{ kg}$$

$$\theta = 60^\circ$$

Fig. P5